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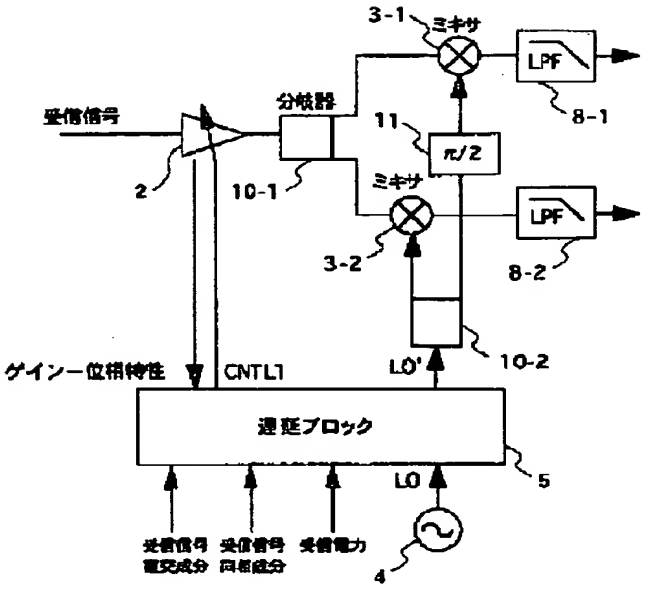

ABSTRACT : PROBLEM TO BE SOLVED: To eliminate phase fluctuation of a received signal which is caused by a gain-phase characteristic of a receiving amplifier in real time.

SOLUTION: The received signal amplified by a variable amplifying means 2 is inputted to mixers 3-1 and 3-2. A reference frequency signal LO from a local oscillator 4 is inputted to a delay block 5, undergoes phase shift as much quantity as to correspond to phase shift quantity acquired by referring to a gain-phase characteristic table of the means 2 and is outputted. The phase fluctuation of a received signal which is caused by a gain-phase characteristic of the means 2 is eliminated by such a manner that the mixers 3-1 and 3-2 perform orthogonal detection of an output of the means 2 by using the output signal LO'.

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F00 E21 Lecture #11

Combinational Logic Elements

More complex combinational logic elements

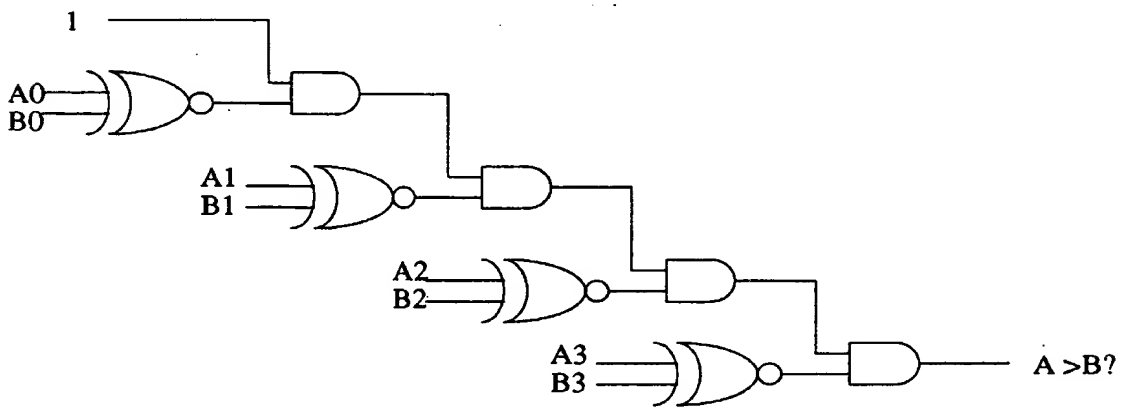
Comparators

An XNOR gate acts as a one-bit comparator: high if equal, low if not

- To compare multiple bits, we could cascade XOR gates and AND gates (see below)
  - This is the way Altera would implement a for loop: unfolding the logic
- A faster way is to compare multiple bits simultaneously and the OR the result

We could also do a cascade system to test for greater-than/less-than

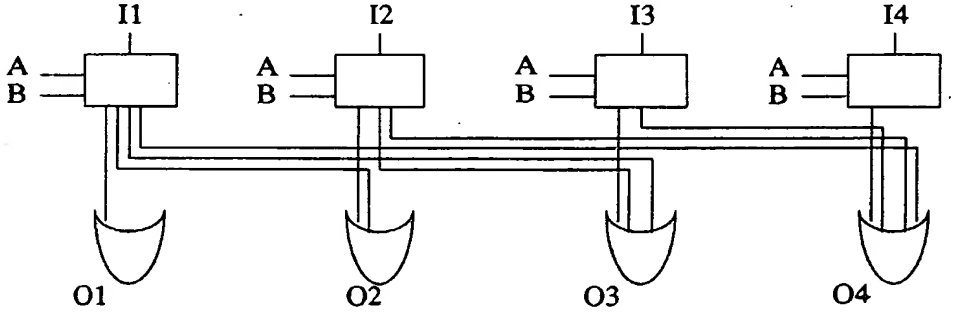
- Greater-than: start with the MSB and work down
- Less-than: start with MSB and work down
- Real implementations use one AND gate for each case and then an OR gate to see if any of the potential greater than/less than situations are true



Shifters/Rotators

We can use DEMUXs on the inputs to generate a shifter/rotator circuit (right shifter shown below)

- One DEMUX for each input
- Address of DEMUX indicates how much to shift the input
- Each output is an OR gate with inputs from the appropriate DEMUXs



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